

## **REMARKS**

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claim 4 was objected to for the misspelling of the word "silicone". Claim 4 has been amended to correct this error. The Examiner's grounds for objection have therefore been removed.

Claim 1 was rejected under 35 U.S.C. 102(a) as being anticipated by applicant's admitted prior art (AAPA). Claims 1 and 2 were rejected under 35 U.S.C. 102(b) as being anticipated by Matsukawa et al. (U.S. Patent No. 6,153,326). The rejections are traversed for the following reasons.

The applicant's discussion in the Background section of the present application is similar to the teachings of the Matsukawa patent, and accordingly, these rejections will be discussed together. Both teach fuel cell separators having rubber layers formed along a peripheral portion of a metal substrate. The background section shows the rubber layers extending very slightly beyond the metal substrate, while the Matsukawa patent shows the rubber layers ending at an edge of the metal substrate. Both teach gas and reaction product passages formed through the peripheral portion, such that the passages pass through each of the two rubber layers, as well as the metal substrate.<sup>1</sup>

The invention defined in claim 1 is directed to a fuel cell separator having a

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<sup>1</sup> For clarification, a sectional view of a wall of one of the passages would include a metal layer sandwiched between two rubber layers.

metal central part and a rubber peripheral part, with gas passages and reaction product passages provided by the peripheral part. Claim 1 has been amended to recite that the rubber peripheral portion includes an outer portion that extends away from the central part, and that the gas passages and the reaction passages are formed through the outer portion. Accordingly, claim 1 now recites that the passages are formed solely through the rubber member.

It is asserted that neither the AAPA, nor the Matsukawa patent, teach a fuel cell separator "having a central part and an outer peripheral part" wherein "an outer portion of the peripheral part extends away from the central part, and the gas passages and reaction product passages are formed through said outer portion", as required by claim 1. As this feature of claim 1 is not taught, the references fail to anticipate the claim. Reconsideration and withdrawal of the rejections is requested. Claim 2 depends from claim 1 and is likewise considered allowable over the art.

Claims 3 and 4 were rejected under 35 U.S.C. 103(a) as being unpatentable over Matsukawa in view of Styczynski (U.S. Patent No. 6,113,827). The rejections are traversed for the following reasons.

Claims 3 and 4 are directed to methods for manufacturing the fuel cell separator as defined in original claim 1. Both claims recite a method whereby the metal central part is disposed in a cavity of an injection-molding mold. The inside of the cavity is maintained at a low temperature, and the liquid silicone rubber is injected into the cavity. The low temperature of the cavity prevents the silicone rubber from reactively setting, and allows the liquid silicone rubber to maintain a low viscosity.

With reference to claim 3, the liquid silicone rubber is guided past an edge

part of the central part. Gas and reaction product passages are formed through the silicone rubber peripheral portion in a position past the edge part of the metal central part. The method is completed by heating the inside of the cavity to reactively set the silicone rubber guided to the edge part of the central cavity.

The Examiner finds the bulk of the method taught by the Matsukawa patent. Matsukawa teaches injection molding rubber layers on both sides of a metal central part, at edge portions of the metal central part. Styczynski is cited for teaching a step of heating a mold cavity to reactively set injection molded silicone rubber. Styczynski does not teach a fuel cell structure, nor does Styczynski teach a method for manufacturing a fuel cell separator. Accordingly, the below discussion will point out the shortcomings of the Matsukawa patent alone, as the Styczynski patent does not remedy any of the shortcomings.

Initially, claim 3 has been amended to recite that the silicone rubber is guided past an edge part of the central portion. With reference to the Matsukawa patent's Fig. 4, the edge of the rubber layers is flush with the edge of the metal central part. Further, the cavity of Matsukawa does not extend past the edge of the central part, making it impossible for the liquid silicone rubber to flow past the edge of the central part. Thus, Matsukawa fails to teach guiding the liquid silicone rubber past an edge part of the central part.

Further, claim 3 has been amended to include the step of forming the gas and reaction product passages through the liquid silicone rubber that has been guided past the edge part of the central part. The passages are formed in a part of the silicone rubber that is past the edge of the central part so as to form the passages solely through the silicone rubber. Matsukawa, as shown in Fig. 4, teaches that the

cavity does not extend past the edge of the central part. Accordingly, the cavity of Matsukawa precludes the formation of passages through the silicone rubber that is past the edge part of the central part, and thus cannot teach a method step of forming the passages through the rubber peripheral portion that is past the edge of the central portion.

Therefore, the combined references fail to teach or suggest all features of the method recited in claim 3. As the references fail to teach or suggest features of the claim, a *prima facie* case of obviousness has not been established to support the claim rejection. Reconsideration and withdrawal of the rejection of claim 3 is requested.

With reference to claim 4, the inventive method recites that the liquid silicone rubber is guided to an edge part of the central part, and that the central part is heated to reactively set the silicone rubber. It is asserted that the combined references fail to teach the heating of the central part as a means to reactively set the silicone rubber.

The Examiner acknowledges that this feature is not explicitly taught by either of the references. Rather, the Examiner states that heating the central part is inherently performed as a result of heating the cavity, as taught by Styczynski. Applicant respectfully disagrees with this assertion.

Initially, the method step recites that the central part is, itself, heated to reactively set the liquid silicone rubber. Such a teaching is in contrast to the teachings of Styczynski, wherein the cavity is heated to reactively set the liquid silicone rubber. The fact that the heating of the cavity may affect a heating of the central part does not equate to teaching that the liquid silicone rubber is reactively

set by heating the central part. Rather, all Styczynski can be cited for teaching is reactively setting the liquid silicone rubber by heating the cavity.

In further support of this proposition is the fact that Styczynski does not teach an element corresponding to the central part. Rather, Styczynski teaches only a cavity into which liquid silicone rubber can be injected and reactively set.

Accordingly, Styczynski does not inherently teach that a non-existent member is heated.

Thus, the combined references fail to teach or suggest a fuel cell separator manufacturing method including a step of "heating the central part to reactively set the silicone rubber guided to the edge part of the central part", as required by claim 4. Consequently, as this feature of the claim is not suggested, a *prima facie* case of obviousness supporting the rejection of claim 4 has not been made.

Reconsideration and withdrawal of the rejection is requested.

Claims 5 – 9 have been added for consideration in the present amendment. Claim 5 depends from claim 1, and further recites that the metal central part includes at least one support hole defined adjacent to an edge of the central part. The support hole is filled by the rubber member so as to attach the rubber member to the central part.<sup>2</sup> Claim 6 depends from claim 5 and further recites that the rubber member is made of silicone rubber. Claims 5 and 6 are considered to be patentable based on their dependence from claim 1. However, notwithstanding the patentability of claim 1, claims 5 and 6 recite additional features that are not taught by the cited references. Favorable consideration of claims 5 and 6 is requested.

Claim 7 depends from claim 4, and further recites a step of forming the gas and reaction product passages in the rubber peripheral portion. Claim 7 is

considered allowable as depending from claim 4. Further, as with the argument above in favor of the patentability of claim 3, this feature is not believed to be taught or suggested by the cited art. Therefore, claim 7 is considered independently allowable over the art. Favorable consideration of claim 7 is requested.

Claims 8 and 9 depend from claims 3 and 4, respectively, and recite a method step of filling a hole defined through the central part with liquid silicone rubber, the hole being adjacent to the edge part of the central part. These claims are considered allowable based on their dependency. Further, the combined references fail to teach this feature.<sup>3</sup> Favorable consideration of claims 8 and 9 is requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. SHM-15820.

Respectfully submitted,

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<sup>2</sup> See element 26 in Figs. 2 and 3.

<sup>3</sup> See the argument above in regards to the independent patentability of claim 5.